Utah Blue Ribbon Advisory Council on Climate Change - Energy Supply Catalog of State Actions

Proposed IGCC/CCS Incentives in Utah (ES Cat B and Cat C)

A. The Need for Clean Coal Technologies to Meet Emissions Reduction Targets.

On May 21, 2007, Governor Huntsman signed on to the Western Regional Climate Action Initiative.[1] The Initaitive directs the states of Arizona, California, New Mexico, Oregon, Washington, and now Utah to develop a regional target for reducing greenhouse gases (GHG) by August 2007. By August 2008, they are expected to devise a market-based program, such as a load-based cap-and-trade program to reach the GHG target. The five states also have agreed to participate in a multi-state registry to track and manage greenhouse gas emissions in their region.

In addition to increased efficiency and renewable energy investment, the development and commercialization of advanced clean coal technology is a critical third component in the portfolio of GHG mitigation actions. The most viable of these technologies today appears to be Integrated Gasification Combined Cycle (IGCC) combined with carbon capture and storage (CCS) technology. There are also emerging CCS technologies that show promise for capturing carbon emissions from traditional pulverized coal fired boilers. These emerging technologies include chilled ammonia scrubbing and oxy-fuel combustion. Carbon capture technologies have the potential to remove approximately 90 percent of a coal plant's CO2 emissions.[2]

IGCC plants generate electricity by gasifying coal and using clean "syn-gas" to fuel a combustion turbine in a combined cycle configuration. IGCC technologies have improved efficiencies compared to traditional pulverized coal plants. The overall efficiency of an IGCC plant depends on gasifier technology and coal type. Improvements in overall efficiency translate into reductions in CO2 emissions; for every one percent of efficiency gain, a plant produces about 2 percent less CO2 per kWh.[3] A generic IGCC plant has a CO2 emissions rate of 1600-1760 lb/MWh as compared to a rate of 2000 lb/MWh for a traditional coal plant.[4] IGCC plants also have reduced air pollutant emissions, such as sulfur dioxide (SO2), nitrogen oxide (NOX) and mercury,[5] compared to pulverized coal-fired plants. Additionally, using currently available

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[1] See, http://gov.ca.gov/mp3/press/022607_WesternClimateAgreementFinal.pdf

[2] PacifiCorp's 2004 IRP at 23, located at http://www.pacificorp.com/File/File47422.

[3] U.S. Department of Energy Fact Sheet: Clean Coal Technology Ushers in New Era in Energy, located at http://www.state.gov/g/oes/rls/or/2006/77196.

[4] "Exhibit 3-18, Emission Data from the Literature" page 3-29, from the Final Report, "Environmental Footprints and Costs of Coal-Based Integrated Gasification Combined Cycle and Pulverized Coal Technologies", EPA-430/R-06-006, United States Environmental Protection Agency, July 2006, located at http://www.epa.gov/airmarkets/articles/IGCCreport.pdf.

[5] PacifiCorp's 2004 Integrated Resource Plan (IRP) Update estimated IGCC reductions of 73% for SO2, 85% for NOX and 22% for mercury over a supercritical pulverized coal plant. PacifiCorp's 2004 IRP Update at 24, located at http://pacificorp.com/File/File57884.

commercial separation technologies, the cost of carbon capture from an IGCC plant is expected to be lower than the cost to capture carbon emissions from a traditional pulverized coal plant.

Both environmental and national security concerns support the accelerated development of advanced clean coal technologies. The North American Electricity Reliability Council recently reported that demand for electricity is increasing three times faster than new generating resources can be added.[6] Coal is the nation's most abundant fuel source.[7] Coal now accounts for 50 percent of the electricity generated in the U.S. and, as the lowest cost source of electricity generation, this percentage is expected to increase.[8]

The important role of advanced clean coal technology is recognized in the Western Public Utility Commissions' Joint Action Framework on Climate Change, signed on December 1, 2006 by the Washington, Oregon, California and New Mexico public utility commissions.[9] The Framework's Statement of Shared Principles includes five principles, the second of which is "Development and use of low carbon technologies in the energy sector." The third of six Action Items is: "Explore ways to remove barriers to development of advanced, low-carbon technologies for fossil fuel-powered generation capable of capturing and sequestering carbon dioxide emissions."

B. Removing Barriers and Providing Incentives to IGCC and CCS Technology Commercialization.

There are a number of barriers that stand in the way of large scale commercial development of IGCC and CCS technologies, particularly for investor-owned utilities (IOUs). Over the last several years, many states and the federal government have passed laws to address the most problematic of these. To promote Utah policies on climate change and sustainability, Utah should join these lawmakers in enacting clean coal legislation.

a. The Need for a Comprehensive Legal and Regulatory Framework for CCS.

CCS raises new legal and regulatory risks associated with siting and permitting projects, CO2 transportation, injection and storage.[10] These risks are not yet fully understood, nor are uniform standards or government regimes in place to address and mitigate them.

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[6] *Mixed Signals Leave Developers Wary of Building New Infrastructure*, 144 Pub Util Fort 4 (Nov 2006).

[7] *Financing Clean Coal*, 143 Pub Util Fort 73 (June 2005).

[8] U.S. Department of Energy Fact Sheet, supra note 3.

[9] Western Public Utility Commissions' Joint Action Framework on Climate Change (December 1, 2006), located at http://www.puc.state.or.us/puc/news/2006/2006026jointaction.

[10] Robertson, K., Findsen, J., Messner, S., Science Applications International Corporation. June 23, 2006. "International Carbon Capture and Storage Projects Overcoming Legal Barriers", prepared for the National Energy Technology Laboratory (see http://www.netl.doe.gov/energy-analyses/pubs/CCSregulatorypaperFinalReport.pdf)

Among the key questions to be addressed in the development of a consistent regulatory framework for CCS are: immunity from potentially applicable criminal and civil environmental penalties; property rights, including the passage of title to CO_2 (including to the government) during transportation, injection and storage; government-mandated caps on long-term CO_2 liability, insurance coverage for short-term CO_2 liability; the licensing of CO_2 transportation and storage operators, intellectual property rights related to CCS, and monitoring of CO_2 storage facilities.

California recently adopted AB 1925, directing the California Energy Commission to recommend standards to accelerate the adoption of long-term management of industrial CO_2.[11] Utah should similarly develop guidelines for addressing the emerging legal and regulatory issues associated with CCS. Among the options it should explore is that adopted by Texas, which transfers the title (and any liability post-capture) to CO_2 captured by CCS to the Railroads Commission of Texas.[12]

b. The Traditional Least-Cost/Least Risk Regulatory Standard Should Be Modified to Allow Development of CCS-Equipped IGCC and Pulverized Coal Resources.

IGCC plants have higher capital and operating costs than traditional coal plants. PacifiCorp's 2004 Integrated Resource Plan Update analyzed the costs of an IGCC plant equipped with CCS technology. This analysis demonstrated that a CCS-ready, IGCC plant costs at least 16.9% more than a supercritical pulverized coal plant.[13] Additionally, while reliable estimates for carbon geologic sequestration costs do not yet exist, the Department of Energy's research program goal is \$10 per MWh.[14]

IOUs in Utah are subject to a least cost, least risk standard for new resources.[15] Additionally, Utah IOUs are required to implement their integrated resource plans through competitive bidding to ensure implementation of this least cost policy.[16] Because the costs of IGCC and CCS technologies are higher than uncontrolled traditional pulverized coal, an IGCC or a CCS investment is difficult to justify under a least cost/least risk standard. For example, in 2003, the Wisconsin Public Service Commission rejected Wisconsin Electric's request for a certificate of need for an IGCC plant on the basis that the plant was not cost-effective.[17]

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[11] California AB 1925 (2006), located at http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_1901-1950/ab_1925_bill_20060926_chaptered.

[12] Texas H.B. 149 (2006).

[13] PacifiCorp 2004 IRP Update at 24, supra note 5.

[14] *Id*.

[15] *See Energy Resource Procurement Act, Utah Code Ann. § 54-17-302(3)*

[16] *See Energy Resource Procurement Act, Utah Code Ann. § 54-17-101 et. seq. (for resources greater than 100 MW with a life or term of ten years or more.)*

[17] *In re: Wisconsin Electric Power Company*, 05-CE-130 (Nov 10, 2003).

Utah should eliminate this barrier to IGCC and CCS technologies for IOUs by adopting a "reasonable and necessary" standard for IGCC and CCS technologies used to serve Utah customers, in place of a least cost/least risk standard. Indiana adopted a similar approach, requiring the Indiana Utility Regulatory Commission to encourage the development of IGCC and CCS as long as it concludes that the projects are reasonable and necessary.[18]

c. Utah Should Enact Tax Incentives to Help Bridge the Cost Gap Between IGCC and CCS Technologies and Traditional Uncontrolled Coal.

To bridge the cost gap between IGCC and CCS technologies and traditional coal, EPACT 2005 contained new investment tax credits for advanced coal technologies, including IGCC.[19] EPACT 2005's IGCC tax credits were heavily over-subscribed, however, with applications totaling $5 billion for only $1.6 billion in credits.[20]

Utah should enact tax incentives to encourage new IGCC and CCS development to serve Utah customers, adding to those already exhausted under EPACT 2005. The most effective combination of tax incentives for IOU development of IGCC and CCS technologies is a tax credit plus accelerated depreciation.

d. The Added Risks and Financing Challenges of IGCC and CCS Should Be Mitigated With Assured, Timely Cost-Recovery.

The developmental nature of IGCC and CCS technologies creates added risk and cost during the pre-construction phase, in construction of the plant and in the plant's performance. While engineering and construction designs for a traditional coal plant cost less than $1 million, an IGCC plant cannot be built without a Front End Engineering Design (FEED) study. Such a study costs $10-$20 million and requires 10-14 months for completion.[21] Because commercial-scale IGCC and CCS technologies are new, the risk of cost-overruns, construction delays and delays in achieving anticipated reliability levels are all higher than for a traditional coal plant.

This added risk and cost create financing challenges for an IGCC or CCS investment. Assured, timely cost recovery, typically achieved by "pay as you go" proposals, is necessary for large IGCC or CCS projects to obtain financing and move forward. For example, the Ohio Public Utilities Commission recently allowed American Electric Power (AEP) to recover an estimated $23.7 million in first-phase IGCC pre-construction costs through a 12-month

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[18] IC 8-1-8.8-11(a), provides that "The Commission shall encourage clean coal and energy projects by creating the following financial incentives for clean coal and energy projects, if the projects are found to be reasonable and necessary."

[19] EPACT 2005, Title XIII, Subtitle A, Section 1307

[20] U.S. Department of Energy Fact Sheet, supra note 3.

[21] PacifiCorp 2004 IRP Update at 26, supra note 5.

generation surcharge.[22] AEP proposed a second-phase of recovery during construction to cover financing costs, and a third-phase to recovery the costs of the plant after it becomes operational. Similarly, the Indiana Utility Regulatory Commission approved the requests of two utilities for deferral and recovery of IGCC pre-construction costs.[23]

Utah should adopt a full and timely cost-recovery standard for IOU investment in IGCC or CCS technologies used to serve Utah customers. Utah Code Ann. § 54-4-4(3) currently allows, but does not require, the Commission to use a future test period in setting retail rates.[24] To mandate "pay as you go" cost recovery for IGCC or CCS investments, Utah's clean coal legislation would need to create a limited exception to this statute for IGCC and CCS investments. Colorado, Indiana and Pennsylvania all provide full cost-recovery assurances for IGCC and CCS by statute; Colorado additionally includes recovery for replacement power costs associated with unplanned IGCC plant outages.[25]

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[22] *In re Columbus Southern Power Co. and Ohio Power Co.*, Case No. 05-376-EL-UNC (Ohio PUC April 10, 2006).

[23] *In re PSI Energy*, Cause 42894 (Indiana URC July 26, 2006).

[24] Utah Code Ann. § 54-4-4((3) (a) If in the commission's determination of just and reasonable rates the commission uses a test period, the commission shall select a test period that, on the basis of evidence, the commission finds best reflects the conditions that a public utility will encounter during the period when the rates determined by the commission will be in effect.
(b) In establishing the test period determined in Subsection (3)(a), the commission may use:
    (i) a future test period that is determined on the basis of projected data not exceeding 20 months from the date a proposed rate increase or decrease is filed with the commission under Section 54 7 12;
    (ii) a test period that is:
        (A) determined on the basis of historic data; and
        (B) adjusted for known and measurable changes; or
    (iii) a test period that is determined on the basis of a combination of:
        (A) future projections; and
        (B) historic data..

[25] Colorado House Bill 06-1281; Indiana IC 8-1-8.8; Pennsylvania SB 1030.